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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER MUKHOPADHYAY, BHASKAR	
			ART UNIT 1794	PAPER NUMBER
			NOTIFICATION DATE 11/30/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/539,570	<b>Applicant(s)</b> PASCAL ET AL.	
	<b>Examiner</b> BHASKAR MUKHOPADHYAY	<b>Art Unit</b> 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on July 6, 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 11-20, 22 and 23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-20, 22 and 23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. In light of the new grounds of rejection as set forth below, the following action is non-final.

#### Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action.

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- a. Determining the scope and contents of the prior art.
- b. Ascertaining the differences between the prior art and the claims at issue.
- c. Resolving the level of ordinary skill in the pertinent art.
- d. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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4. Claims 11, 13-17, 20, 22, and 23 rejected under 35 U.S.C. 103(a) as being unpatentable over Mills (Mills, J.T. Insect-Fungus Associations Influencing Seed Deterioration. Phytopathology. 1983. Vol. 73 (2). pp. 330-335) in view of Montville et al. (Montville, T.J., Goldstein, P.K. 1989. "Sodium Bicarbonate Inhibition of Aflatoxigenesis in Corn." J. Food Protect. Vol. 52 (1). pp. 45-48).
5. Mills teaches that grain mites (acarids) commonly occur in combination with *Aspergillus spp.* in stored cereals and oilseeds (Table 1).
6. Mills is silent as to the use of sodium bicarbonate to combat acarids.
7. Montville et al. teach sodium bicarbonate would be a safe, inexpensive way to control aflatoxin production in stored grains including corn (p. 45 cols. 1-2). They teach that sodium bicarbonate inhibits aflatoxin production and the growth of *A. parasiticus* in corn. (Abstract).
8. The sodium bicarbonate used by Montville et al. consists essentially of sodium bicarbonate, resulting in a powder comprising greater than 95% sodium bicarbonate. As sodium bicarbonate is generally recognized as safe (GRAS) it is also considered to be free of neurotoxic substances.
9. The combination is silent as to the particle size of the sodium bicarbonate.
10. As Mills teaches acarids commonly occurring in cereals in combination with *Aspergillus*, and Montville et al. teaches sodium bicarbonate for its fungicidal effects against *Aspergillus spp.* in cereals, it would have been obvious to one of ordinary skill to treat the cereals infested with *Aspergillus spp.* and acarids with sodium bicarbonate.

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The effect of the sodium bicarbonate on the acarids would have been inherent as sodium bicarbonate is the same active ingredient as taught by Montville et al. as a fungicide. Recognizing that sodium bicarbonate has acaracidal, as well as fungicidal and insecticidal, effects are considered to be the recognition of an inherent property. As the prior art teaches the treatment of cereals with sodium bicarbonate, the claimed invention is considered to be obvious over the teachings of the prior art.

11. Regarding the particle size of sodium bicarbonate to be used in the invention, one of ordinary skill would have been able to determine the particle size of the sodium bicarbonate which proved most effective as a fungicide and against acarids. Absent any convincing arguments or evidence of unexpected results, this would have required no more than routine experimentation on the part of the artisan.

12. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mills in view of Montville et al. as applied to claim 11 above, and in further view of Applying Pesticides Correctly (The Ohio State University, 1992).

13. The combination of Mills and Montville et al. teaches applying sodium bicarbonate to cereal crops. Montville et al. speak to the large scale application of sodium bicarbonate to grains (p. 47 col. 2 last paragraph).

14. The combination is silent as to the application of the sodium bicarbonate to silo walls.

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15. Regarding claim 12, Applying Pesticides Correctly teaches that a wettable powder formulation of a pesticide will leave more pesticide on the surface (p. 72 col. 2). They go on to state that spaces such as silos may be treated (p. 72 col. 2). Additionally, they speak to the covering of surfaces with pesticides (p. 73 col. 2).

16. As the combination of Mills and Montville et al. teaches the farm level application of sodium bicarbonate to corn, and Applying Pesticides Correctly teaches a method for applying pesticides to silo walls, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have sprayed the composition taught by Mills in view of Montville et al. onto surfaces as taught in Applying Pesticides Correctly in order to coat the inside surface of a silo so that the pesticide may come into contact with cereals stored in the silo.

17. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mills in view of Montville et al. as applied to claim 11 above, and in further view of Misato et al. (4,599,233).

18. The combination of Mills and Montville et al. teaches applying sodium bicarbonate to cereal crops.

19. The combination is silent as to the presence of silica in combination with the sodium bicarbonate.

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20. Misato et al. teach a fungicide composition comprising sodium bicarbonate (Abstract). They state that their composition may also contain a carrier such as silica (col. 5 line 20).

21. Misato et al. are silent as to the use of silica gel.

22. As the combination of Mills and Montville et al. teaches the application of sodium bicarbonate as a fungicide, and Misato et al. teaches sodium bicarbonate as a fungicide in combination with silica, one of ordinary skill would have found it obvious to utilize silica as a carrier in the invention of Mills in view of Montville et al. in order to provide the most uniform coating of the cereals with the acaracidal/fungicidal composition.

23. In regard to claim 19 and the use of silica gel, it would have been obvious to one of ordinary skill in the art to have selected silica gel for use in the invention of Misato et al. as it is widely known and readily available desiccant. One skilled in the art would also have been able to adjust the amount of silica gel used in the invention to result in a product with the most desirable application properties for the intended application.

24. Claims 11, 13-14, 16, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mills (Mills, J.T. Insect-Fungus Associations Influencing Seed Deterioration. Phytopathology. 1983. Vol. 73 (2). pp. 330-335) in view of Knight, USPN 5,439,690.

25. Regarding claim 11, 13- 14, 16, and 23, Mills teach about storage of cereals and grain mites (Table 1, under "Postharvesting storage and handling" , it says 'cereals and

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oilseeds'). Mills also teach about fungivorous mites and symbiotic relationship between mites and fungi. Mills teaches that fungi also provide food for mites (p332, the full paragraph under "Interactions involving symbiosis between insects and fungi" describes the phenomena and in particular, col 2, in Para 2<sup>nd</sup>, line 5, says ' fungivorous mites').

26. Mills does not teach about the use of sodium bicarbonate as fungicide and/or insecticide to combat acarids.

27. Knight teaches about the use of 60% powdered sodium bicarbonate in a non – hazardous ( Title, e.g. 'non-hazardous') formulation ( col 3, lines 65-67, and col 4, lines 1-27, e.g. 'kill insects') and size of about 0.1 microns ( Col 4, line 65, e.g. '.1 micron).

28. It would have been obvious to one of ordinary skill in the art at the time of invention to include the teaching of Knight into Mills. One of ordinary skill in the art would have been motivated to use higher concentration e.g. 60%, of sodium bicarbonate combination with calcium carbonate at the appropriate concentration to combat (a) insecticidal and fungicidal properties into the composition and (b) thus minimizing available food for the fungivorous mites and destroy acarids by reducing growth of fungivorous acarids.

29. Claims 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mills (Mills, J.T. Insect-Fungus Associations Influencing Seed Deterioration. Phytopathology. 1983. Vol. 73 (2). pp. 330-335) in view of Knight, USPN 5,439,690 and further in view of Rochat et al. (US 2008/0311168).



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30. Regarding claims 17 and 20, Mills teach about storage of cereals and grain mites (Table 1, under “Post harvesting storage and handling”, it says ‘cereals and oilseeds’).

31. Mills also teach about fungivorous mites and symbiotic relationship between mites and fungi. Mills teaches that fungi also provide food for mites (p332, the full paragraph under “Interactions involving symbiosis between insects and fungi” describes the phenomena and in particular, col 2, in Para 2<sup>nd</sup>, line 5, says ' fungivorous mites').

32. Mills in view of Knight does not teach about the use of sodium bicarbonate as fungicide and/or insecticide to combat acarids.

33. Rochat et al. teach about acarids belong to the group of arthropods divided into subclasses: insects and arachnids ([0017]) and reducing or eliminating the amount of acarids present in the environment by using zinc sulphide ([0019]). Rochat et al. also teach about zinc sulfide may be used less than 5% ([0027]) in the formulation in combination with (silicates and carbonates ([0035])).

34. It would have been obvious to one of ordinary skill in the art at the time of invention to include the teaching of Rochat et al. into Mills in view of Knight. One of ordinary skill in the art would have been motivated to use zinc sulfide in combination with sodium bicarbonate at the appropriate concentration to combat acaricidal property into the composition by (a) reducing fungal growth primarily by sodium bicarbonate and thus minimizing available food for the fungivorous mites and (b) imparting more strength in the composition by using zinc sulfide to have combined acaricidal, fungicidal, and insecticidal effects.

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35. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mills in view of Knight as applied to claim 11 above, and in further view of Applying Pesticides Correctly (The Ohio State University, 1992).

36. Mills and Knight teach applying sodium bicarbonate at 60% concentration to cereal crops.

37. Regarding claim 12, Mills and Knight, however, do not teach about the application of the sodium bicarbonate to silo walls.

38. Applying Pesticides Correctly teaches that a wettable powder formulation of a pesticide will leave more pesticide on the surface (p. 72 col. 2). They go on to state that spaces such as silos may be treated (p. 72 col. 2). Additionally, they speak to the covering of surfaces with pesticides (p. 73 col. 2).

It would have been obvious to one of ordinary skill in the art at the time the invention to include the teaching of “Applying Pesticides Correctly” into Mills in view of Knight. One of ordinary skill in the art at the time of invention would have been motivated to spray the composition onto surfaces as taught in Applying Pesticides Correctly in order to coat the inside surface of a silo so that the pesticide may come into contact with cereals stored in the silo.

39. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mills in view of Knight and further in view of “NPL Inorganic compounds ---Silica gel” ( in “ Inorganic compounds----Industrial applications”. Ed by L Ciullo, 1996).

40. Regarding claims 18, and 19, the combination of Mills in view of Knight teach applying sodium bicarbonate to cereal crops.

41. Mills in view of Knight , however, do not teach the presence of silica as carrier and use of silica gel.

42. "NPL Inorganic compounds ---Silica gel" teach about silica, including silica gel, as carrier (p444, line 6<sup>th</sup> line from the bottom and last line of last but one paragraph) may be used in the composition ( p452, under 'termites', silica gel 10%). It is obvious that silica gel as carrier may be used in the formulation having sodium bicarbonate.

It would have been obvious to one of ordinary skill in the art at the time of invention to include the teaching of "NPL Inorganic compounds ---Silica gel" into Mills in view of Knight. One of ordinary skill in the art would have been motivated to use silica gel as it exhibits dehydrating properties to dehydrate the organism and thus destroy them.

### **Response to Arguments**

43. Applicants' arguments filed on 7/6/2009 , have been fully considered.

44. Applicants argue that Mills does not teach that fungi presence is necessary to acarids survival. Mills, however, teach that mites are fungivorous and there is a "symbiotic relationship" between them. This suggests that the fungicides like (a) sodium bicarbonate deprive mites (acarids) from food by destroying fungi ( p332, The full

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paragraph under “Interactions involving symbiosis between insects and fungi” describes the phenomena and in particular, col 2, in Para 2<sup>nd</sup>, line 5, says ' fungivorous mites') and also Montville teaches sodium bicarbonate is also active against *A. parasiticus*, which is mold, and thus the pesticidal effect of sodium bicarbonate is extended beyond fungicidal effect including acarids.

45 In addition, Monteville teaches that sodium bicarbonate is an inexpensive GRAS (generally recognized as safe) compound with demonstrated activity against some food-borne bacteria and yeast and against oral pathogens (Paragraph 4<sup>th</sup>, from Abstract, and just above “ Materials and Methods). Thus, acarids include in the broad spectrum world of pathogens.

46. Applicants refer to their showing of results. It is presumed this is referring to the data set forth in the specification. The data compares, for instance, cereal treated with sodium bicarbonate with cereal treated with silica gel with cereal treated with combination of sodium bicarbonate and fumed silica with cereal with no treatment (control). However, the data is not persuasive given that the data is not commensurate in scope with the scope of the present claims given that it appears that the data establishes that using combination of silica gel/sodium bicarbonate is superior to using sodium bicarbonate alone. However, the present claims, with the exception of claim 19, only require the use of sodium bicarbonate. Further, with respect to claim 19, the data is not commensurate in scope with the scope of the present claims given that while there

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is data that utilizes sodium bicarbonate and either 4% silica gel or 10% silica gel, claim 19 only broadly requires the use of at least 1% silica gel.

As set forth in MPEP 716.02 (d), whether unexpected results are the result of unexpectedly improved results or a property not taught by the prior art, "objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support". In other words, the showing of unexpected results must be reviewed to see if the results occurred over the entire claimed range, *In re Clemens*, 622 F.2d 1029, 1036, 206 USPQ 289, 296 (CCPA 1980). Applicants have not provided data to show that the unexpected results do in fact occur over the entire claimed range of more than 1% silica.

Additionally, it appears that the % mortality depends on both the type of grain mite (as seen in comparing data in tables 1 and 2) as well as the time at which the % mortality was measured (for instance Table 2 shows that at 24 hours and 48 hours there is no difference between control example and sodium bicarbonate example). However, such limitations are not found in the present claims.

### **Conclusion**

47. Any inquiry concerning the communication or earlier communications from the examiner should be directed to Bhaskar Mukhopadhyay whose telephone number is (571)-270-1139.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on (571)-272- 1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/B.M. /  
Patent Examiner, Art Unit 1794

/Callie E. Shosho/  
Supervisory Patent Examiner, Art Unit 1794